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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/729,058	12/04/2000	Anke Krasemann	GR 99 P 5363	6468
24131	7590	07/21/2004	EXAMINER	
LERNER AND GREENBERG, PA P O BOX 2480 HOLLYWOOD, FL 33022-2480			MENZ, DOUGLAS M	
			ART UNIT	PAPER NUMBER
			2824	

DATE MAILED: 07/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/729,058

Applicant(s)

KRASEMANN ET AL.

Examiner

Douglas M Menz

Art Unit

2824

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 21 is/are pending in the application.
- 4a) Of the above claim(s) 1-4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (APA) in view of Agarwal (US 6218256).

Regarding claim 5, APA discloses a capacitive electrode structure (Prior Art Fig. 1), comprising:

A semiconductor substrate (Si) including silicon (Prior Art Fig. 1);

A metal barrier layer (SiO_2) disposed on the semiconductor substrate (Si), the metal barrier layer (SiO_2) being of silicon oxide (Prior Art Fig. 1 and Spec. Page 2, line19 – Page 3, line 13);

A metal oxide layer (MeO) disposed on the metal barrier layer (SiO_2), the metal oxide layer being one of TiO_2 , Ta_2O_5 , and Al_2O_3 (Prior Art Fig. 1 and Spec. Page 2, line19 – Page 3, line 13);

APA does not disclose wherein an oxidation inhibiting layer comprising titanium nitride or tungsten silicide, is disposed on the metal oxide layer, followed by a metal layer disposed on the oxidation inhibiting layer.

Agarwal discloses a refractory metal capacitive electrode structure (Figs. 2-6), which incorporates an oxidation inhibiting layer (16) comprising titanium nitride that is disposed on a Ta_2O_5 dielectric layer, followed by a metal layer (18) disposed on the oxidation inhibiting layer (Figs. 2-6 and Col. 4, line 28 – Col. 6, line 30).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify APA's structure to include Agarwal's teachings for the purpose of reducing the diffusion of elements between the dielectric and the electrode as taught by Agarwal (Col. 5, lines: 25-50).

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (APA) in view of Chittipeddi et al. (US 6294807).

Regarding claim 21, APA discloses a capacitive electrode structure (Prior Art Fig. 1), comprising:

A semiconductor substrate (Si) including silicon (Prior Art Fig. 1);

A metal barrier layer (SiO_2) disposed on the semiconductor substrate (Si), the metal barrier layer (SiO_2) being of silicon oxide (Prior Art Fig. 1 and Spec. Page 2, line19 – Page 3, line 13);

A metal oxide layer (MeO) disposed on the metal barrier layer (SiO_2), the metal oxide layer being one of TiO_2 , Ta_2O_5 , and Al_2O_3 (Prior Art Fig. 1 and Spec. Page 2, line19 – Page 3, line 13);

A polysilicon layer (Poly-Si) disposed on the metal oxide layer (Prior Art Fig. 1 and Spec. Page 2, line19 – Page 3, line 13).

APA does not disclose wherein a layer of silicon nitride is disposed between the metal oxide layer and the top polysilicon layer.

Chittipeddi discloses capacitor structures which incorporate a tantalum pentoxide (Ta_2O_5) dielectric that is sandwiched between silicon nitride layers (Abstract, Fig. 1, and Col. 3, lines: 35-65).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use a layer of silicon nitride on top of the tantalum pentoxide (Ta_2O_5) layer of the Admitted Prior Art's structure for the purpose of preventing diffusion of the tantalum, as taught by Chittipeddi (Abstract and Col. 2, lines: 38-65).

Response to Arguments

Applicant's arguments with respect to claim 5 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas M Menz whose telephone number is 571-272-1877. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on 571-272-1869. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DM


VAN THU NGUYEN
PRIMARY EXAMINER